TIDAL BASS SURVEY
Standard Operating Procedure
2010

Prepared by Joseph W. Love, Ph.D.
Tidal Bass Manager
Maryland Department of Natural Resources
Division of Inland Fisheries

This SOP will be updated at least annually or more frequently as needed

Table of Contents

I. Scope of the Survey

1.1 Mission of Survey

The mission of the Tidal Bass Survey is to generate reliable indices that monitor tidal populations of black bass (*Micropterus salmoides* and *M. dolomieu*) in order to protect and enhance the tidal bass fishery for the State of Maryland.

1.2 Objectives of Survey

The objectives of the tidal bass survey are: 1) to generate data on abundance of black bass and habitat conditions; 2) to analyze trends in the abundance, age, and growth of black bass; and 3) to determine how habitat conditions influence the distribution, abundance, and growth of black bass.

1.3 Period of Survey

The Tidal Bass Survey shall conduct two, independent surveys: a juvenile and an adult survey. Juvenile surveys will be conducted during mid to late summer. The adult survey will be conducted from September through October. In all cases, specific dates and times will be specified by regional managers who are leading the survey efforts. Dates may vary by weather conditions. All adult surveys should be completed prior to November, when water temperature generally reaches 10° C.

1.4 Rivers of Survey

The Tidal Bass Survey shall annually survey selected sites within 5 river systems: the Potomac River, the rivers of the Upper Bay, the Choptank River, the Nanticoke River (Marshyhope Creek), and the Pocomoke River. These rivers should be sampled each year to generate a long-term data set that represents natural variation in population dynamics, as well as changes in population size due to environmental or anthropogenic influences. The Patuxent River, Chester River, and Wicomico River should be surveyed biannually for juveniles. For each year, each region will survey tidal bass for approximately 17 – 19 days. The total number of sampling days expected to perform all surveys as listed is 39, with 31 of those allocated to permanent, annually surveyed rivers (Table 1.1). As targeted rivers for the Tidal Bass Survey change, this Standard Operating Procedure (SOP) will be updated with both the change and the justification of the change.

Table 1.1. Sampling program for major river systems of the Chesapeake Bay. The number of sampling days performed by Southern and Eastern Regions in 2007 or 2008 is also given.

River	**Annual (Adult)**	**Biannual (Juvenile)**	**Sampling Days (2008)**	**Region**
Potomac	X		12	Southern
Patuxent		X	2	Southern
UBay (All)	X		5	Southern
Choptank	X		5	Eastern
Chester		X	3 (2007)	Eastern
Nanticoke	X		5	Eastern
Wicomico		X	3	Eastern

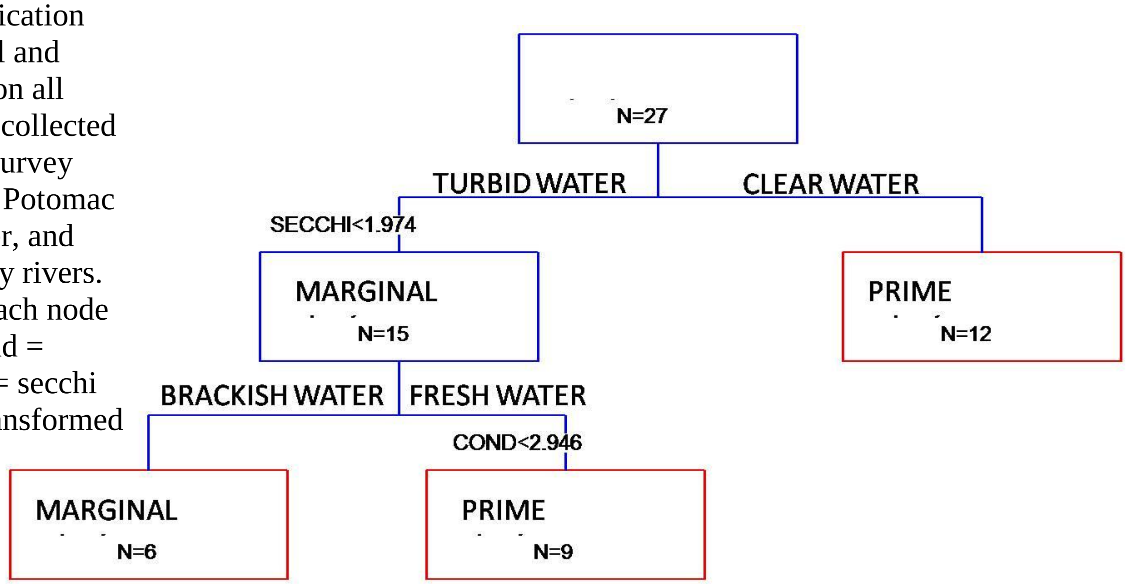
II. Adult Survey

2.1 Protocol for Site Classification

Sampled sites were classified by habitat and stratified according to habitat type. Rivers were divided into regions of prime or marginal habitats for tidal bass based on previous site-inspections (annually, 1999 – 2008). Marginal regions were generally defined as mostly downstream reaches, and/or those lacking significant habitat structure and prone to significant water loss during falling or ebb tides. Prime habitats were generally defined as those with clear and fresh water (Fig. 2.1). These regions were mapped using ArcGIS (Fig. 2.2). Because strata definition varied over years for several sites, the classification with the greatest frequency over time was used to classify sites for this SOP. In cases when both habitats were classified with the same frequency over time (i.e., 50% of the time as prime, 50% of the time as marginal), then sites were classified tentatively as marginal until the site was groundtruthed. Groundtruthing of site classifications during the surveys should be completed every 3 – 5 years, or as necessary. All sites historically classified as average habitat were re-classified as prime habitat because of the observed little difference in these two habitat types and in levels of abundance (unpubl. data, JWL).

In order to classify stretches of stream and neighboring, unclassified sites, buffer zones (0.5 km radius) around each classified site were generated to classify the included stretch of stream. Sites that were not originally classified by initial studies (1999 – 2008) were then classified based on the classifications of neighboring sites. When a site was located in a stretch of stream that was characterized by both prime and marginal habitat, the site was classified as an average site (see Fig. 2.2). When a site was not located in a classified stretch of stream, then it was not classified; these latter sites were not used in site selection procedures (see below).

Figure 2.1. A classification tree dividing marginal and prime habitats based on all available habitat data collected during the tidal bass survey (1999 – 2008) for the Potomac River, Choptank River, and upper Chesapeake Bay rivers. N = sample size for each node or terminal node. Cond = conductivity; Secchi = secchi depth; values were transformed by $\log_{10}$.



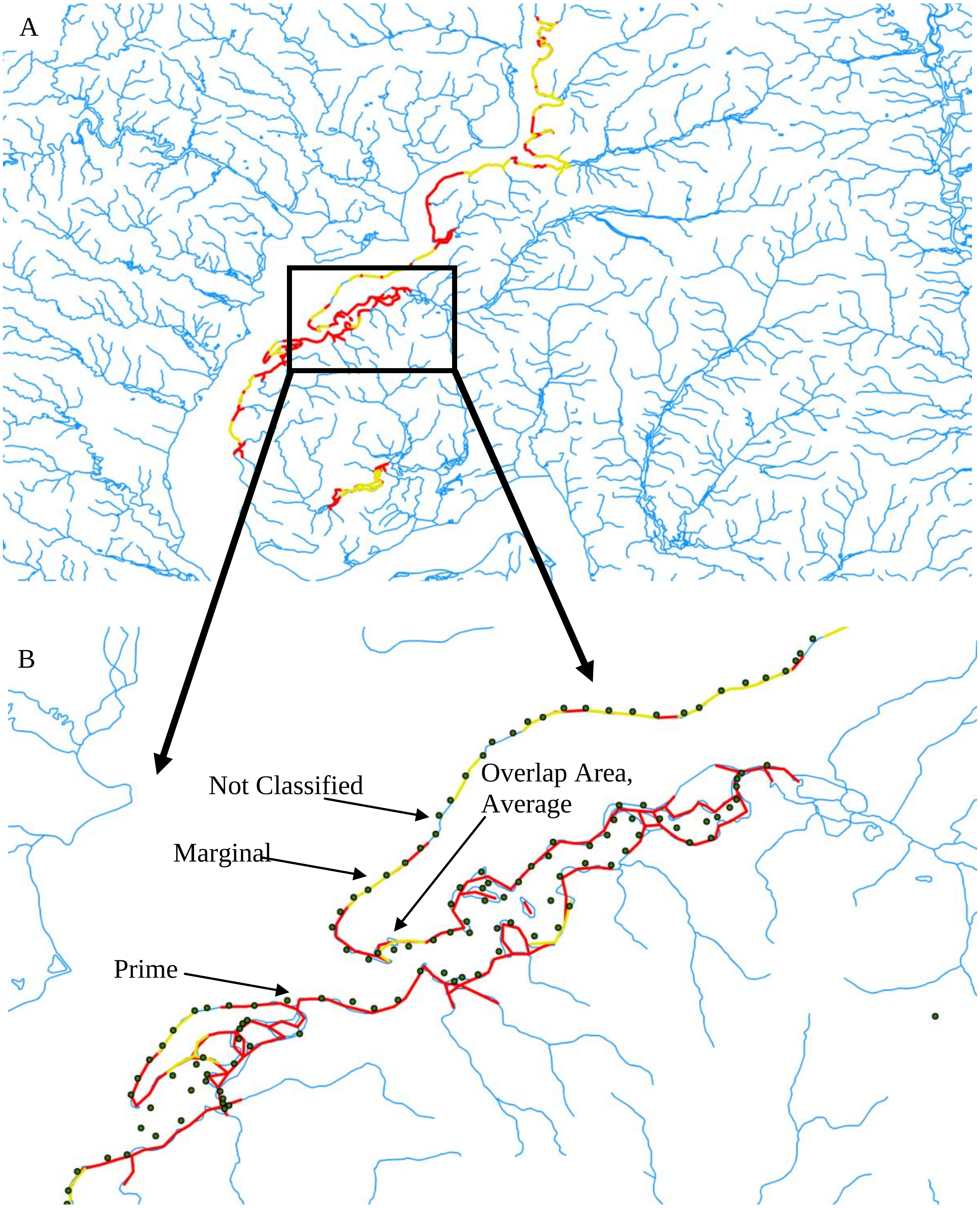


Figure 2.2. Map of upper Potomac River watershed coded with streamline classified by marginal (yellow) and prime (red) habitat (A). Classifications were computed based on available data (1999 – 2008). The boxed inset (B) illustrates Mattawoman Creek with a magnified view of streamside classifications, including a region of overlap that may be considered "Average" habitat and a region of unclassified habitat that requires classification data.

2.2 Protocol for Site Selection

The total number of sites chosen per river will depend on the number of historically chosen sites, which is a reflection of the amount of practically surveyed habitat within the watershed. The number of potentially sampled sites ranges from 93 (Pocomoke River) to 394 (Potomac River), with the average number of sites actually surveyed ranging from 30 (Pocomoke River and Nanticoke River) to 44 (Potomac River). The potential number of sites included those spaced at approximately 250 m increments along the river, ranging from the most downstream location historically surveyed to the most upstream site historically surveyed. Based on power analyses of data for 2008 in the Potomac River, a sample size of 45 would be sufficient for reasonably estimating catch with a relatively low level of variance (data not shown, JWL). A sample size of 45 is approximately 11% of the sites that can be potentially surveyed. Using this percentage as a guide for estimating the number of sites surveyed for other rivers, the number of sites surveyed for rivers should range from 18 (Pocomoke River and Nanticoke River) to 45 (Potomac River)(Table 2.1).

Table 2.1. For targeted rivers of the tidal bass survey, the average number of sites surveyed (AveNumSites; across years for each river), along with the potential number of surveyed sites (PotNumSites) and the proposed number (PropNumSites) and percentage of sampled sites (%Sites) for the river. The expected number of days to complete the survey, assuming 6 sites per day, is also given.

River	AveNumSites	PotNumSites	PropNumSites	%Sites	Days to Completion
Pocomoke	30	95	18	19	3
Nanticoke	30	93	18	19	3
Potomac	44	394	45	11	8
Choptank	34	210	30	14	5
Upper Bay	36	202	30	15	5

From the total number of sites that will be surveyed for each river, a proportion will be randomly chosen from the prime stratum, from the average stratum, and from the marginal stratum. Prior data indicate that variance within the prime habitat stratum was much greater than that for the marginal stratum. As a result, the number of sites within the prime habitat stratum should be at least 3:1 (Table 2.2). Thus, the proportional number of sites chosen for the prime habitat stratum will be three times that of average and marginal habitats. In the event of remarkable changes in the number of prime and marginal sites, habitat classifications should be re-evaluated. Then, the number of sites within each stratum should be surveyed using a proportion that minimizes variance within the stratum, but with a minimum number of sites of 5 for each stratum.

Table 2.2. The observed and expected ratios of Average, Marginal, and Prime Sites surveyed for the Potomac and Choptank Rivers of the Chesapeake Bay watershed. Expected ratios were calculated using the Neyman Allocation method.

	River	Year	Prop A	Prop M	Prop P
Expected	Potomac	1999 – 2008	2	1	5
Expected	Choptank	1999 – 2008	1	1	2
Observed	Potomac	1999 – 2008	1.7	1	2
Observed	Choptank	1999 – 2008	1	1.6	1.6

Researchers will not be told whether they are surveying a prime, average, or marginal habitat. In the event that pre-assigned site is not practically sampled on the day of sampling, then researchers may: 1) choose to survey the site at a later time; or 2) choose another site from a list of 5 alternative sites. The alternative sites will be chosen randomly from all potential sites.

2.3 Protocol for Sampling

Prior to sampling, equipment needed for survey work will be checked for measurement accuracy and calibrated. While a survey check-list may be warranted in some cases, the development of such a check-list is at the discretion of the regional manager. If equipment is faulty in the field, then it should be noted that a sincere effort was made to immediately remedy the problem. All faulty equipment should be repaired prior to the next sampling day. When costly repairs or replacement units are needed, the appropriate regional manager and the tidal bass manager should be notified so that a resolution can be quickly reached.

Prior to sampling, the dates and location of sampling should be made known to the tidal bass manager and the webmaster so that the information can be posted on the Tidal Bass Survey website.

On the sampling day, a minimum of three researchers is required for this survey. The captain of the electroshocking boat will not be responsible for removing or processing specimens. The captain will be responsible for float plans, piloting the vessel to georeferenced locations that are provided by the tidal bass manager, spotting stunned black bass, and recording data. The remaining two researchers will be responsible for netting fish as they are stunned and reach the surface water. Both researchers may apply electric current to the water column, but one should be designated as the principal of the two. When stunned, fish should be immediately removed from the electric field. Notes of the number of fish that escape from the field should be made. These numbers should be written on the datasheet and noted as, “escaped”. Only positive identifications of black bass should be noted. If a fish escapes, then researchers should not exert more than 1/20th of the overall minimum effort expected for the site (or approximately 13 seconds of shock time; see below) to obtain the specimen.

During sampling, researchers should survey each site in a systematic manner. The manner will be defined by: 1) a slowing of boat speed just prior to sampling; 2) the researcher at the bow should instruct the captain when sampling should begin; 3) a researcher at the bow will apply electricity to the water constantly as the boat vessel travels parallel to the shoreline, or as the boat vessel travels toward the shoreline, if surveyed using a scalloped matter (Fig. 2.3); 4) all microhabitats within the site should be sampled with equal effort; and 5) *irregularities or deviations from this SOP will be noted in the comments section on the datasheet*. A combination of parallel and scalloping techniques may be conducted when electroshocking is conducted as the vessel moves parallel the shoreline and when it moves toward the shoreline. In the cases where scalloping is used, the captain will be responsible for ensuring that the moves toward shore occur at equidistant increments along the stretch of surveyed stream.

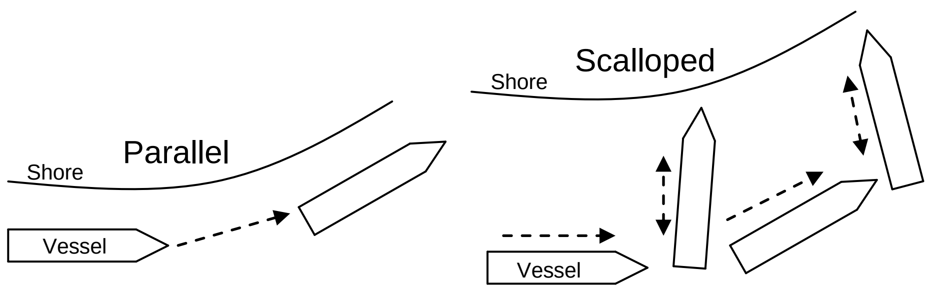


Figure 2.3. Figure depicting two sampling methods utilized by the tidal bass survey. Parallel surveys are defined by times when electroshocking is conducted while the boat vessel is moving parallel with the shoreline. Scalloped surveys are defined by times when electroshocking is conducted while the boat vessel moves toward the shoreline.

The amount of time electroshocking will likely differ among sites, but a minimum amount of effort should be spent and standardized across sites. From 1999 – 2008, when no tidal bass were collected, the average number of seconds spent electroshocking ranged from 183 to 393 (Table 2.3). The median number of seconds was 253. This value falls within the range of seconds needed to obtain 1 black bass, which was 202 to 472 seconds. Thus, the minimum number of seconds spent shocking fish will be 200 seconds.

While it is expected that the level of effort spent at a site may differ among sites because of logistic issues, every effort should be made to maintain consistency and minimize bias. To that end, researchers should take care to sample every observable microhabitat, which traditionally has encompassed a shoreline of approximately 250 m. Starting and ending coordinates will be provided for each site by the tidal bass manager. These coordinates should serve as an approximate guide to orient the researchers in the presumed direction and extent of sampling, but may change depending on logistics of the sampling day.

Table 2.3. Minimum, maximum, and average number of seconds spent shocking when 0 and when 1 black bass were collected. Data reflect those for historically surveyed rivers (1999 – 2008) in the Chesapeake Bay watershed.

River	Min Secs for 0 Bass	Max Secs for 0 Bass	Ave Secs for 0 Bass	Ave Secs for 1 Bass
Potomac	174	610	385	472
Patuxent	125	532	314	404
UBay (All)	84	733	278	296
Choptank	81	475	219	254
Chester	63	527	228	243
Nanticoke	141	323	214	252
Wicomico	105	355	183	202
Pocomoke	265	481	393	319

2.4. Protocol for Handling Procedures

When black bass are stunned, they should be quickly transferred to an oxygenated (near or above 100% oxygen saturation), re-circulating holding tank. Temperature and dissolved oxygen of the water in the holding tanks should be monitored regularly to ensure ambient, oxygenated water is provided the tidal bass.

Most specimens will be measured for total length (in millimeters) and weighed (in grams) before being returned to the site from where they were taken. The types of measurements may differ between juvenile and adult surveys, but these will be detailed in the datasheets (see Section 4.1). In some cases, a fish may be too active or difficult to obtain a weight. In those cases, the fish will be released following its length measurement; a weight will not be obtained. In those cases, "NA" will be recorded for the weight measurement.

When a tagged fish is encountered both length and weight measurements will be obtained (if possible) and the tag number, recorded. During selected years, black bass may be tagged using t-bar or another external tag. When tagging operations are required, all researchers performing the tagging operations will meet to discuss tagging methods and ensure that all procedures are similar. Anesthesia may be administered using MS-222 or another appropriate agent prior to tagging. Following tagging, the fish should be monitored in a holding tank for at least 3 - 4 minutes to ensure that the tag is anchored and that the fish does exhibit signs of morbidity.

During the adult survey, a small random sample of individuals may be sacrificed for life history information every third year, beginning in 2009 (Table 2.4). This random sample will not exceed 25 individuals per river in a year. A maximum of 5 individuals from discrete size classes (Table 2.5) sampled within each river will be taken. Throughout the course of the survey on the targeted river, the first 5 individuals meeting the length requirements will be sacrificed. These individuals will constitute a random sample for the river population because sites will be randomly chosen within each stratum. Additional specimens may be necessary, but this will be decided and discussed prior to the survey of each river. Sacrificed individuals will be measured, weighed, placed in a bag with a waterproof label detailing river and date, and euthanized by chilling or freezing.

Table 2.4. Proposed number of largemouth bass (*Micropterus salmoides*) to sacrifice for surveyed rivers.

River	**Samples**
Potomac	10, only those < 310 mm TL
Patuxent	NONE
UBay (All)	25
Choptank	10, only those < 310 mm TL
Chester	NONE
Nanticoke	25
Wicomico	NONE
Pocomoke	25

Table 2.5. Length-at-age key for largemouth bass (*Micropterus salmoides*). For each age, the lower (75%) and upper (25%) bounds for total length (mm).

Age (Yrs)	**Lower Bound**	**Upper Bound**	**Sample Size**
0	0	200	9087
1	201	249	1639
2	250	310	205
3	311	373	244
4	361	421	190
5+	415	473	339

III. Juvenile Survey

3.1 Protocol for Site Classification

Sites will not be classified according to a stratified sampling design.

3.2 Protocol for Site Selection

Sites that are surveyed for juvenile black bass will be fixed sites and surveyed biannually using either electroshocking or another suitable method (e.g., fyke nets). Fifteen sites will be surveyed in targeted rivers. Each river should be surveyed biannually. Sites will be selected based on their accessibility and their habitat characteristics. Habitats that are thought to support spawning activities, including gravel and/or grass bed habitats, will be targeted. Sites will be distributed within a stream reach to maximize geographic distance and to minimize correlation in the variances among sites.

3.3 Protocol for Sampling

If electroshocking is used to survey juveniles, then the minimum number of seconds spent shocking fish should be 200 seconds (as above). Juvenile bass (< 200 mm TL) will be removed from the water, measured, and released to aerated holding tank prior to their release to the site of capture. The method of electroshocking should follow that mentioned for the adult survey, unless backpack electroshocking is used. In the case of backpack shocking, the backpack shall be floated into the survey area and the stream waded by researchers. A minimum of two persons is required for backpack electroshocking. One individual will be responsible for waving the electrode wand. The other individual will be responsible for netting fish. All stunned fish will be removed from the water and placed into at least a 10 gallon bucket with stream water. Once electroshocking is completed, then all fish will be returned to their habitat.

If fyke netting is used to survey juveniles, the fyke net will be set for a maximum of 24 hours. The fyke net (1.25 cm mesh, 15.2 m leader) will be set perpendicular to the shore with the cod end aimed toward the main channel. The leader end will be tethered to a pole inserted near the bank. Juvenile bass will be removed from the cod end of the fyke net, measured, and released to their habitat.

Equipment needed for survey work should be checked for measurement accuracy or calibrated before sampling commences. While a survey check-list may be warranted in some cases, the development of such a check-list is done at the discretion of the regional manager. If equipment is faulty in the field, then it should be noted that a sincere effort was made to immediately remedy the problem. All faulty equipment should be repaired prior to the next sampling day. When costly repairs or replacement units are needed, the appropriate regional manager and the tidal bass manager should be notified so that a resolution can be quickly reached.

3.4 Protocol for Handling Procedures

Juvenile black bass should be handled with at least the same level of care that is outlined in Section 2.4. Juvenile black bass are more sensitive to electroshocking activity (pers. comm. M. Groves, Southern Division Regional Manager). Adjusting settings of backpack shocker units may be necessary to minimize gear impact. Fish that escape the stun field may be tallied to the datasheet and additional shocking may not be necessary. A tally of an escaping individual is preferable over aggressive capture for length/weight measurements when those measurements could mean the death of the fish.

IV. Data Collection and Disposition

4.1 Protocol for Data Collection

Prior to collecting data, all researchers participating in the survey should be made fully aware of the information they are recording and how that information is obtained. Researchers should all be collecting data in a consistent and uniform manner, using similar gear and rationale. Subjective information, such as the percentage of submerged vegetation, should be measured as consistently as possible among all researchers. Moreover, while Tidal Bass Survey datasheets have been organized following an evolutionary period of 8 years, the language may not be perfectly understood or clear. A meeting prior to sampling events may be necessary for ensuring quality of the data collection.

All data should be recorded using pencil or waterproof ink on waterproof paper. For consistency, all tidal bass surveys shall use the datasheets in the Appendix of this document. Electronic versions are available on two network drives, the transfer drive, H:/transfer/tidal bass and the common drive, J:/Inland fisheries/tidal bass. All data must be collected. When data is left un-collected, then the letters "NA" must be written in the appropriate data spot and justification made in the comments block. Modifications of the data sheet should be discussed and made prior to the survey so that all researchers are given enough time to note the change. The tidal bass manager should attend to as many sampling events as possible so that consistency and clarity can be ensured among sampling events.

4.2 Protocol for Data Disposition

Following data collection, all data sheets will be collated and scanned to *.pdf files. A scanned file will contain all data sheets for a river and for a year. The file will be named by river and year and be stored in the appropriate folder in H:/transfer/tidal bass and the J:/inland fisheries/tidal bass drives.

Data sheets will be stored at the regional office with whom the survey was conducted. No data sheets will be discarded until all sheets have been scanned and checked by at least two researchers. It would be preferable to maintain the physical datasheets for a period of at least 10 years. No data sheets will be discarded without notifying the regional managers, the tidal bass manager, and the director of inland fisheries.

4.3 Protocol for Data Entry

Data will be entered into an archival data base, currently GIFS. The regional office responsible for the survey will administer the entry of data into the archival data base.

Data will also be entered into a Microsoft Excel database that is currently stored on H:/transfer/tidal bass. These data will be entered by the tidal bass manager using the electronic, *.pdf data sheets.

4.4 Protocol for Quality Assurance/Quality Control Procedures

Data entered into the archival data base will be cross-checked by a second researcher. Pass data will be checked against those presented on the data sheet. When a mistake is noted, it will be brought to the attention of the first researcher who will then correct the mistake.

All GPS coordinates presented on the data sheet will be checked by the tidal bass manager for their accuracy.

Data entered into the Microsoft Excel database will be checked by secondarily checked using data sheets from the survey. When errors are found, the tidal bass manager will be notified of the error, which will then be corrected by the tidal bass manager.

V. Common Sense Provision

Safety of researchers and living organisms supersedes the desire for quality or robust data. Field ecology is challenged by changing environmental conditions, perception and background of the researchers, and “demonic intrusion” or unpredictably, maligning events. **The best defense against challenging conditions is common sense.** When an event arises that challenges the traditional collection of data, then researchers should collectively choose the best course of action by weighing ramifications of such a choice against the act of doing nothing. Researchers are held accountable for their actions and the data they collect. The highest standard of scientific ethics is expected.

APPENDIX

Tidal Bass Adult Survey Data Sheet

Collector* Initials______
* Collector is the person recording the data

Date: _____/_____/_____
River: ______________________________
Site Number: ______________________
Site Description ____________________

Tidal Stage:
- ☐ High Ebb
- ☐ Med Ebb
- ☐ Low Ebb
- ☐ High Slack
- ☐ High Flood
- ☐ Med Flood
- ☐ Low Flood
- ☐ Low Slack

Weather:
- ☐ Cloudy
- ☐ Overcast
- ☐ Rain
- ☐ Sunny
- ☐ Windy

Start Time: ____________ Stop Time: ___________
Start Lat ____ _____._____ Stop Lat ____ _____._____
Start Long ____ _____.____ Stop Long____ _____.____
Site Length _________ (meters)
Electrofisher: Electrofishing Duration: ______ (seconds)
Voltage: ____ High ____ Low ______Amps (mean value)
Pulse Rate: ________ Percent of Range: ________

Aquatic Vegetation (AV) Coverage in Sampling Area: (0 – 100%, 5% increments)

% SAV ________ % emergent ________ % algae ________ AV density (check one): ____dense ____med. ____sparse

List common AV species (if known): ____

Stream Side Zone (Check if present):

Agriculture ________ Urban ________ Forest ________ Wetland ________ Paved ________ Beach ______ Riprap _______

In-Stream Habitat: (Check if present):

Gravel _________Snag ________Deep Drop-off ________Pier/Bulkhead _______Wreck/Barge ________Mudflat ________

Water Quality (WRITE IN UNITS):

Wat Temp: _________Cond. __________ Sal. __________ DO __________ pH __________

Secchi Depth: __________ MinDepth __________ MaxDepth __________

Largemouth Bass Data (WRITE IN UNITS):

Fish #	TL (___)	Wt (____)	TagType	Tag#
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Fish #	TL (___)	Wt (____)	TagType	Tag#
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

Bass were generally caught:

Throughout habitat ____ In specific habitats (list as noted above):____

(backside)

Fish #	TL (___)	Wt (____)	TagType	Tag#
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				

	Species	TL range	Count	Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Survey Notes

Number of Individuals Kept:________

Number of Returned, Moribund Individuals: _________

Additional Comments:

Tidal Bass Juvenile Survey Data Sheet

Collector* Initials______
* Collector is the person recording the data

Date: _____/_____/_____
River: ________________________________
Site Number: _________________________
Site Description _______________________

Tidal Stage:
- ☐ High Ebb
- ☐ Med Ebb
- ☐ Low Ebb
- ☐ High Slack
- ☐ High Flood
- ☐ Med Flood
- ☐ Low Flood
- ☐ Low Slack

Weather:
- ☐ Cloudy
- ☐ Overcast
- ☐ Rain
- ☐ Sunny
- ☐ Windy

Start Time: ____________ Stop Time: ___________
Start Lat ____ _____._____ Stop Lat ____ _____._____
Start Long ____ _____.____ Stop Long____ _____._____
Site Length _________ (m) Sampling Method:________________

Electrofisher: Electrofishing Duration: _______ (seconds)
Voltage: _____ High _____ Low ______Amps (mean value)
Pulse Rate: ________ Percent of Range: ________

Aquatic Vegetation (AV) Coverage in Sampling Area: (0 – 100%, 5% increments)

% SAV ________ % emergent ________ % algae ________ AV density (check one): ____dense ____med. ____sparse

List common AV species (if known): ____

Stream Side Zone (Check if present):

Agriculture ________ Urban ________ Forest ________ Wetland ________ Paved ________ Beach ______ Riprap _______

In-Stream Habitat: (Check if present):

Gravel ________Snag ________Deep Drop-off ________Pier/Bulkhead _______Wreck/Barge _________Mudflat ________

Water Quality (WRITE IN UNITS):

Wat Temp: _________Cond. ___________ Sal. ___________ DO ___________ pH ___________

Secchi Depth: ___________ MinDepth ___________ MaxDepth ___________

Largemouth Bass Data (WRITE IN UNITS):

Fish #	TL (___)	Wt (____)	TagType	Tag#
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Fish #	TL (___)	Wt (____)	TagType	Tag#
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

Bass were generally caught:

Throughout habitat ____ In specific habitats (list as noted above):____

(backside)

Fish #	TL (___)	Wt (____)	TagType	Tag#
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				

	Species	TL range	Count	Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Survey Notes

Number of Individuals Kept:________

Number of Returned, Moribund Individuals: _________

Additional Comments: